COACH Inputs

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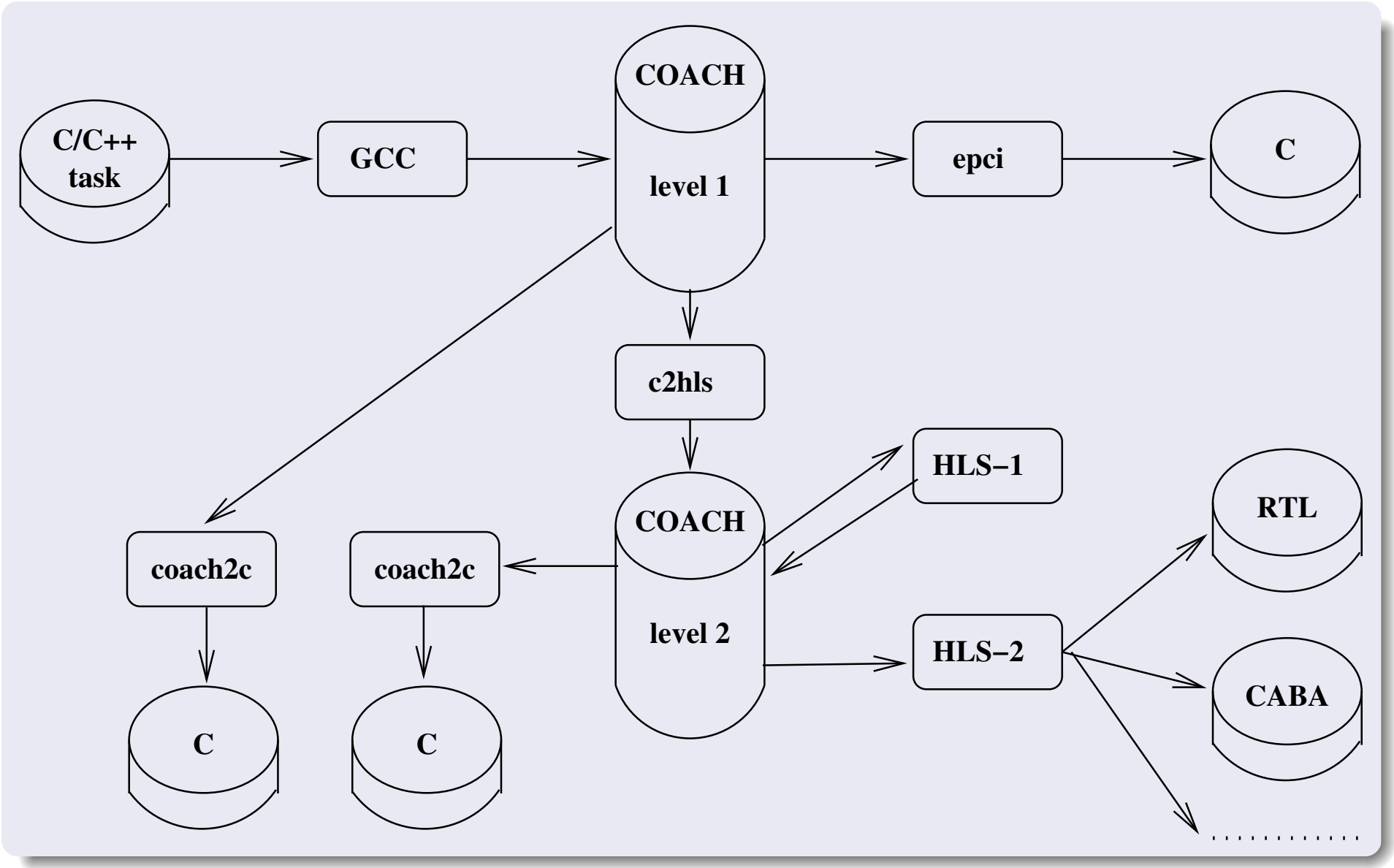
Outline

1. User level
2. Data structure
3. Basic Block instructions
4. Questions

COACH & GCC links



COACH LEVEL

Level 1 close to GCC

Level 2 close to HLS

- no pointer
- linear array
- function parameters taged in, out and inout
- if statement are DP wired

Outline

1. User level
2. Data structure
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4. Questions

Top level

program

- Type set
- Variable set
- Function set
- Scop set
- Extern function set

Top level

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- Type set
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types (LEVEL 1)

- signed : DI, bit-size
- unsigned : DI, bit-size
- signed fixed-point : DI, bit-size, left-bit-size, round-kind
- unsigned fixed-point : DI, bit-size, left-bit-size, round-kind
- structure : DI, set of variables.
- union : DI, set of variables.
- array : DI, integer, type
- array : DI, sequence of integers, type
- pointer : ?

Top level

program

- Type set
- Variable set
- Function set
- Scop set
- Extern function set

types (LEVEL 2)

- signed : DI, bit-size
- unsigned : DI, bit-size
- signed fixed-point : DI, bit-size, left-bit-size, round-kind
- unsigned fixed-point : DI, bit-size, left-bit-size, round-kind
- structure : DI, set of variables.
- union : DI, set of variables.
- array : DI, integer, type
- array : DI, sequence of integers, type
- pointer : ?

Top level

program

- Type set
- Variable set
- Function set
- Scop set
- Extern function set

global variables

- DI, user name
- identifier
- type

no explicit static global variable, we use the identifier.

Top level

program

- Type set
- Variable set
- Function set
- Scop set
- Extern function set

function

- DI, user name
- identifier
- set of (type, direction, name)
- set of variables
- Basic Bloc graph

scope of variable : 1 parameters, 2 local variables, 3 global variables

Top level

program

- Type set
- Variable set
- Function set
- Scop set
- Extern function set

scop

- identifier
- Basic Bloc where scop starts (or starting BB ?)
- (Set ?) Basic Bloc(s ?) where scop ends (or end BB ?)

Top level

program

- Type set
- Variable set
- Function set
- Scop set
- Extern function set

external function

- name
- set of (type, direction, name)

Basic Bloc Graph

Basic Bloc Graph

- Basic Bloc set
- Basic Bloc (entry point)

Basic Bloc

- Identifier
- Instruction sequence
- Successor set

Loop Basic Bloc

- Basic Bloc Graph (body)
- variable set
- Iteration condition

Basic Bloc Graph

Basic Bloc Graph

- Basic Bloc set
- Basic Bloc (entry point)

Basic Bloc

- Identifier
- Instruction sequence
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Loop Basic Bloc

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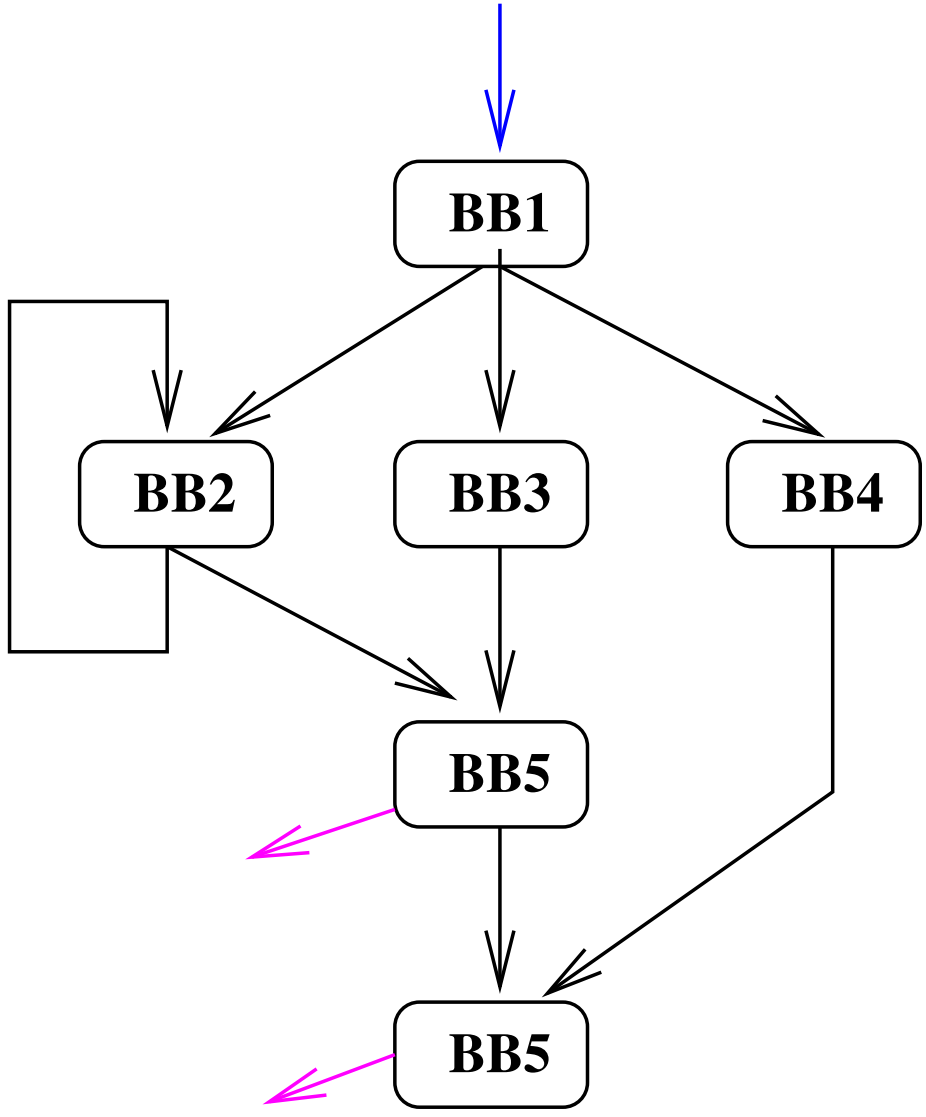

Basic Bloc Graph

Basic Bloc Graph

- Basic Bloc set
- Basic Bloc (entry point)

set of (condition,basic bloc)
$\cup c_i = 1$ *and* $\forall\, i, j\ c_i \cap c_j = 0$

Basic Bloc

- Identifier
- Instruction sequence
- Successor set

Loop Basic Bloc

- Basic Bloc Graph (body)
- variable set
- Iteration condition

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Statement

- assignment set
- scop start
- scop end
- function call
- debug function call

Statement

- assignment set
- scop start
- scop end
- function call
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example 1 :

$$a = x[i] + 10 * (1 < 6?6 : z)$$

example 2 :

$$a = x + 10 * a$$
$$b = a + 10$$

example 3 : (level 2)

$$a[i] = x[i][j] + 10 * (1 < 6?6 : * * * * z)$$

Statement

- assignment set
- scop start
- scop end
- function call
- debug function call

- identifier
- variable sequence

last statement of basic bloc ?
uniq statement of basic bloc ?

Statement

- assignment set
- scop start
- scop end
- function call
- debug function call

- string with predefined token
- variable sequence

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Problems & Questions

- Function
- Scheduling information
- Mapping information
- Fixing Level 1 and level 2

Problems & Questions

- Function
- Scheduling information
- Mapping information
- Fixing Level 1 and level 2

- no a Basic Bloc element
- a transition to basic blocs

Problems & Questions

- Function
- Scheduling information
- Mapping information
- Fixing Level 1 and level 2

- micro-code of BB
- begin & end sheduling cycles of statements

Allow to generate CABA model

Problems & Questions

- Function
- Scheduling information
- Mapping information
- Fixing Level 1 and level 2

- variable/register mapping
- opertion/operator mapping

Problems & Questions

- Function
- Scheduling information
- Mapping information
- Fixing Level 1 and level 2

- To fixe clearly the differences
- Every tool must indicates which level it uses